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Summary

Sixty steers were individually fed for a 101-day period to evaluate two corn processing methods, dry rolled (DRC) or 29% moisture reconstituted corn (HMC), in combination with two levels of alfalfa hay (0% and 7% DM) in finishing diets containing 25% wet corn gluten feed (WCGF). Final body weight was greater for the steers fed DRC compared to steers fed HMC diets. Steers receiving DRC treatments had a 16% higher DMI than HMC treatments. DMI was greater in the DRC 7% alfalfa treatment than DRC 0% alfalfa treatment, while there was no difference between the HMC treatments. There was a trend for a better feed conversion for DRC 0% alfalfa hay compared to HMC 0% alfalfa hay. The results indicate that 25% WCGF inclusion level was insufficient to overcome the subacute acidosis associated with diets based on high moisture corn in this study.

Introduction

Different rates of ruminal digestion have been observed due to corn processing. Higher rates of digestion can lead to subacute acidosis. Thus, different responses relative to the inclusion levels of milling by-product and forage in finishing rations would be expected. The use of corn milling by-products as energy sources in finishing diets could reduce the subacute acidosis problem associated with high-energy finishing diets and reduce the need for including forage. The objective of this trial was to compare cattle performance when two corn processing methods, reconstituted high moisture and dry rolled, and two levels of alfalfa are fed to finishing cattle. All diets included 25% wet corn gluten feed (WCGF).

Procedure

Sixty steer calves (initial BW 877 + 4.8 lb) were stratified by weight and assigned randomly to one of four treatments in a 2 x 2 factorial design. Treatments consisted of either dry rolled corn or high moisture corn in combination with 25% WCGF (Sweet Bran 60, Cargill corn milling) with two levels of forage inclusion (0% or 7% alfalfa hay, Table 1). Steers were individually weighed on three consecutive days under restricted feeding (DMI was 2% of BW) at the start of the experiment and two consecutive days at the end of the experiment. Starting on June 25, 2003, steers were individually fed for 101 days using Calan electronic headgates. Orts were collected when necessary to determine individual intake. At the end of the trial, steers were harvested at a commercial abattoir. Final weight was calculated from carcass weights using a common dressing percentage (63%). Hot carcass weight (HCW) was obtained the day of slaughter; fat thickness and rib eye areas (REA) were obtained after a 24-hour chill. Yield grades were calculated using REA, HCW and back fat, assuming a 2% kidney, pelvic and heart (KPH) fat. Statistical analysis was performed using mixed procedures of SAS. Data from two steers were removed from the analysis due to morbidity not related to treatments. Class

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Table 1. Diet composition (% DM).

	HMC 0% ALF	HMC 7% ALF	DRC 0% ALF	DRC 7% ALF
DRC	—	—	72	65
HMC	72	65	—	—
Wet corn gluten feed	25	25	25	25
Alfalfa hay (ALF)	0	7	0	7
Supplement	3	3	3	3

Table 2. Effects of corn processing method and alfalfa level in 25% WCGF diets

	DRC		HMC				
Alfalfa Level (% DM)	0	7	0	7	SEM	Corn Processing Method	Alfalfa
Final weight lb	1328	1323	1238	1276	12.5	<0.01	0.36
DMI lb/day	22.97	24.51	19.80	21.01	0.37	<0.01	0.01
ADG lb/day	3.76	3.69	2.99	3.24	0.11	<0.01	0.57
Yield Grade	2.30	2.35	1.53	1.91	0.08	<0.01	0.08
Fat, in 12th rib	0.433	0.453	0.303	0.400	0.02	<0.01	0.03
Marbling	554	482	510	510	19	0.18	0.75
REA	15.3	13.9	14.7	14.5	0.2	0.05	0.70

statements included corn source and alfalfa levels, and model statements included corn source, alfalfa levels and their interaction.

Results

There were no interactions on corn processing method by alfalfa level ($P>0.05$), except there was a trend in feed conversion. Dry matter intake was 16% higher ($P<0.05$) for cattle fed DRC than for cattle fed HMC. Final BW was 5% higher for the treatments with DRC. ADG was 19% higher ($P<0.05$) for cattle fed DRC than HMC, however, feed efficiency was not significantly different ($P>0.05$) between the two corn processing methods. Fat thickness and yield grades were greater ($P<0.05$) for cattle fed DRC and marbling scores tended ($P<0.18$) to be higher in the DRC treatments, but REA was larger in the HMC treatments. Alfalfa level influenced ($P=0.01$) DMI, being higher for the 7% alfalfa treatment compared to the 0% alfalfa treatment. However, including alfalfa did not significantly ($P>0.05$) influence ADG, final weight or F:G. Fat thickness was higher ($P<0.05$) for steers fed treatments with alfalfa, while alfalfa inclusion did not affect ($P>0.05$) marbling scores or REA.

A trend ($P=0.14$) for a corn processing method and alfalfa level was observed for F:G. Alfalfa decreased feed efficiency (6.58 vs 6.10 F:G) when fed in the DRC diets while alfalfa increased feed efficiency (6.45 vs 6.67) in the HMC diets. The ADG advantage of feeding DRC treatments compared to feeding HMC treatments contradicts previous research (*2001 Nebraska Beef Report* pp. 59-63). The difference with previous research might be due to the lower WCGF level used in the present trial (25%), compared with previous trials, but also may be related to the type of experiment. In this experiment, cattle were individually fed whereas previous research (*2001 Nebraska Beef Report* pp. 59-63; *2003 Nebraska Beef Report* pp 25-27) was conducted in research pens (8 steers/pen). The WCGF inclusion level in this trial may not have been sufficient to overcome the higher acidotic challenge with the HMC diet. These data suggest that the value of forage in feedlot diets may depend on the corn processing method when diets contain WCGF.

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